# The FIELD ARTILLERY JOURNAL

NOV.-DEC. 1947

AIRBORNE ARTILLERY . . . page 348
By Brig. Gen. Wm. N. Gillmore

★ ★ ★ ★ ★

**PUBLISHED BIMONTHLY BY THE UNITED STATES FIELD ARTILLERY ASSOCIATION WHICH WAS FOUNDED IN 1910 WITH THE FOLLOWING OBJECTS—AS WORTHY NOW AS THEN**

***The objects of the Association shall be the promotion of the efficiency of the Field Artillery by maintaining its best traditions; the publishing of a Journal for disseminating professional knowledge and furnishing information as to the field artillery's progress, development and best use in campaign; to cultivate, with the other arms, a common understanding of the powers and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country.***

★

**The**
**UNITED STATES FIELD ARTILLERY ASSOCIATION**

*Organized June 7, 1910*

*Honorary President*
**HARRY S. TRUMAN**
**President of the United States**

**LIEUTENANT GENERAL RAYMOND S. McLAIN, President**

**MAJOR GENERAL CLIFT ANDRUS, Vice-President**

**COLONEL BRECKINRIDGE A. DAY, Secretary-Editor and Treasurer**

★

*EXECUTIVE COUNCIL*

**Lt. Gen. Raymond S. McLain**
**Maj. Gen. Anthony C. McAuliffe**
**Maj. Gen. Frank E. Lowe**
**Brig. Gen. Harold R. Barker**
**Brig. Gen. Edward S. Ott**
**Col. Charles H. Swartz**
**Col. Jess Larson**
**Col. John Lemp**
**Lt. Col. Robert B. Neely**

★

**The Field Artillery Journal is not a medium for the dissemination of War Department doctrine or administrative directives. Contributors alone are responsible for opinions expressed and conclusions reached in published articles. Consistent with the objects of our Association, however. The Field Artillery Journal seeks to provide a meeting ground for the free expression of artillery ideas in the changing present.**

**COLONEL BRECKINRIDGE A. DAY Editor**

**MAJOR NELSON L. DRUMMOND, JR. Associate Editor**

**LENNA PEDIGO Business Manager**

★ ★ ★ ★ ★

# The FIELD ARTILLERY JOURNAL

***"Contributes to the Good of Our Country"***

**VOL. 37** **NOVEMBER-DECEMBER, 1947** **NO. 6**

- Cover: Service Practice at VILA MILITAR. A Brazilian battery during training of the Brazilian Expeditionary Force in 1944 with now U. S. weapons. Photo from JBUSMC.
- Frontispiece: Christmas Greetings from the Commanding General, Army Ground Forces.



*In view of the recent INTERAMERICAN CONFERENCE for the MAINTENANCE of CONTINENTAL PEACE and SECURITY, held in Rio de Janeiro, which our Association's Honorary President, Colonel Harry S. Truman. Field Artillery Reserve, attended in his capacity of PRESIDENT of the UNITED STATES, we feel we are most fortunate in being able to publish this timely article showing in a small way what is being done at a lower level to enhance Hemispheric Solidarity.

Published bimonthly by The United States Field Artillery Association. Publication office: 3110 Elm Avenue, Baltimore, Md. Editorial and executive offices: 1218 Connecticut Avenue, Washington 6, D. C. Address all communications for publication to the Washington office. Entered as second class matter August 20, 1929, at the post office at Baltimore, Md. Accepted for mailing at the special rate of postage provided in Sec. 1103. Act of October 3, 1917. Copyright, 1947, by The United States Field Artillery Association. Subscription rates: $3.00 a year; foreign, $3.50; single copies, 60 cents; additional single copies to subscribers, 50 cents. The Field Artillery Journal does not accept paid advertising. It does pay for original articles accepted, but unsolicited manuscripts must be accompanied by return postage if they are to be returned.

# *The New Grasshopper— L-16*

***Prepared in The Air Training Department, The Artillery School***

THE L-16 AIRPLANE is being procured by the Air Force from the Aeronca Aircraft Corporation for issue to Army Ground Force and National Guard Units. Like the L-4, it is a light, two-place, high-wing, commercial-type, land airplane of elementary design. It has no flaps, no controllable-pitch propeller and no other heavy accessories. The L-16 was not specifically designed for "grasshopper" service. It is practically a civilian model, emboding a few army modifications — a more powerful fuel-injection engine, more plexiglass for better visibility, and less of the interior trim which helps sell the civilian model. It is well to remember that the L-4 which performed yeoman service in combat was also one of these off-the-shelf airplanes.

The purpose of this article is to describe the L-16 — what it is like, how it flies, how it compares with the L-4. Veteran flight instructors of the Air Training Department, The Artillery School, conducted tests to estimate these characteristics, and to recommend procedures and flight handling of the airplane in Army Ground Forces work.

On the ground the L-16 seems quite sturdy and handsome. It has a four-cylinder horizontal-opposed fuel-injection 80-horsepower engine with a metal propeller and the usual Aeronca wing whose pronounced dihedral makes the airplane easily recognized in flight. A surprisingly roomy cockpit enables both pilot and observer to move around without much bending of legs and elbows. The plexiglass provides considerably better visibility in the same areas of the aerial sphere than the L-4. The blind spots below the fuselage, to the rear, and above the wings are the same. The observer faces forward.

***Starting and Stopping the Engine.*** The fuel-injection engine requires a different starting procedure. In hot weather or when the engine is warm, it starts more quickly if priming pull-throughs are omitted. If the primer has been previously disengaged it can be used just as the engine catches. Stopping the engine is different also. The switch should be cut at 1500 RPM and the throttle opened immediately to overcome the tendency of the engine to continue firing. Because of fuel injection, there is no carburetor heat control.

***On the Ground.*** The low cowling, the downward sloping nose and the high seat give the pilot better visibility in taxiing than is the case with the L-4. S-turns are unnecessary except when taxiing over unfamiliar ground. Of course taxiing on strange strips will have to be done as carefully as ever. The radius of turn of the L-16 on the ground is not as short as that of the L-4. This seems especially true in a cross wind. The brakes are mechanical and can be applied full force with two people in the airplane. For solo flying, which is done from the front seat, there is a tendency for the airplane to nose over if the brakes are used too hard. A good way to avoid nosing over is to apply the brakes alternately with quick, light jabs.

On take-off, a pilot accustomed to the L-4 will immediately notice the torque correction required. This characteristic goes with the additional 15 horsepower. It is nothing to be alarmed about. The L-16 takes off best if it is permitted to roll in 3-point position until the tail becomes noticeably lighter. The increased visibility which the pilot has, particularly if sitting on a seat-type parachute, allows him to see the ground ahead during the roll. Slight forward pressure after the tail starts up will bring the tail on up to take-off position. From there, the airplane will break ground quickly. Attempts to raise the tail prematurely add to the drag and lengthen the take-off run. The normal take-off run is slightly longer than that of the L-4.

***In the Air.*** The L-16 climbs steeply after take-off without any tendency to "mush." The angle of climb is steeper than that of the L-4, although the low nose cowling may at first conceal the true angle. The torque correction is similar to that required in heavier airplanes. Right rudder must be used in climbs, left rudder in glides. In case the "pants-seat" warning escapes the pilot, a simple ball is included on the panel.

In a short time the pilot will become accustomed to flying with the nose down in level-flight attitude. Here again the visibility is excellent. It cruises at 2400 RPM, and it can be trimmed there to fly "hands and feet off."

The L-16 gives ample warning of an impending stall, and recovery is rapid with forward stick and throttle. In slow flight just above a stall the ailerons are effective. It spins smoothly and recovers quickly with normal recovery technique. Spins out of turns are enlightening. From a tight turn to the

right the L-16 spins easily over the top. The spin out of the bottom of a right turn is more difficult since torque must first be overcome. In a left turn the airplane will spin out of the bottom *without any rudder pressure,* the spin entry being sudden and positive. It will continue the spin as long as the stick is back. The spin over the top from a left turn requires a certain amount of forcing. It is apparent that the L-16 controls may be crossed easily if the pilot is not flying it correctly. This tendency is not overly dangerous providing the pilot recognizes this characteristic and knows exactly what he is doing before he attempts prolonged slow turns at low altitudes.

The twin-exhaust-stack arrangement of the L-16 produces an irregular engine-exhaust noise which definitely exceeds that of the L-4. Furthermore, abrupt movements of the throttle cause vibration in the engine, cowling, and windshield. Slow, smooth operation of the throttle reduces vibration considerably.

***Short Field Landings and Take-offs.*** The L-16 can make an excellent power approach at an indicated air speed of about 54 miles per hour with a throttle setting of 1400 RPM. At this speed and throttle setting the airplane has no tendency to "mush" and the rate of descent is approximately 500 feet per minute. The nose of the airplane is just slightly above level flight. Slips are good, especially those to the left, and recovery from slips is both easy and prompt. It is evident, however, that recovery from slipping turns to the right can produce a spin over the top if rudder and stick are not properly coordinated.

Since this airplane cruises at 90 miles per hour indicated, more time is required to attain slow flight than is required with the L-4. However, once slow flight has been established, the power approach characteristics are similar. Landings on the oleo gear are smooth and positive. There is little tendency to float unless excessive power is applied just before the landing. It is well to remember that the gear on this airplane is much stronger than the gear on the L-4. A longeron will often give way in a hard landing before the gear gives.

In comparative air-strip work the L-4 can land closer to a barrier by approximately 75 feet, although the ground roll after touchdown is about the same for both airplanes. The take-off run of the L-4 is about 10 feet shorter, but the L-16 with its steeper angle of climb will clear a barrier as high (or higher) as any cleared by an L-4.

All in all, it is the opinion of the flight instructors that the L-16 is definitely superior to the L-4 in comfort and visibility. It is as stable as the L-4, and it climbs faster. Its torque characteristics are similar to those of heavier airplanes. Undoubtedly the L-16 will not be quite so forgiving of poor flying technique as the L-4. As with any new airplane, the pilot should fly the L-16 with respect until he has definitely obtained the feel of it.

***Transition.*** It has often been said that no pilot can be considered to know an airplane until he has flown it for 25 hours. Since the L-16 flies differently every pilot should be required to undergo a complete transition period. During this period he should practice coordination exercises, turns, stalls, normal spins, lazy-eights, and spins out of turns. Power approaches should be practiced at a safe altitude until the pilot is thoroughly familiar with the slow flight and power stall characteristics of the airplane. Actual power approaches and landings should commence on larger strips and work down to shorter ones. Nose-high turns from the base leg to the approach leg should be avoided. Slow flight should begin only after the airplane is definitely lined up with the strip on the final approach. If proper care is given to the transition training of pilots in the L-16, it will achieve the same if not better results than the L-4. It simply flies a little more like a heavy airplane.

**TAS BOOK DEPARTMENT NOTICE**

**This notice relative to purchase of Restricted Publications by INDIVIDUALS from the Book Department, The Artillery School, is published for the information of all concerned:**

**Attention is directed to TM 38-405 as a guide for individuals who desire to purchase Instructors' Outlines, Problems, Writs, etc., or assembled packages of these publications, which have been classified as "Restricted," through the Book Department, The Artillery School.**

**Paragraph 10, TM 38-405, directs that an individual have his request certified as to the identity of the purchaser by his superior officer as follows: Regular Army officer, by his Commanding Officer or Adjutant; National Guard officer, by the Adjutant General of the state or a Regular Army officer instructor detailed with the National Guard; Reserve officer, by a Regular Army officer instructor detailed with the Organized Reserves; ROTC cadet, by a Regular Army officer instructor detailed with his unit; Enlisted man, by his immediate commanding officer; National Guard or Reserve enlisted man, by his immediate commanding officer, who will forward through his normal channels as indicated above.**

**Compliance will avoid unnecessary delay in filling orders for these materials.**